

What we claim is:

1. A band control device comprising:
 - a controller for aggregating a plurality of physical links into a single logical link, and
- 5 a distributor for distributing a traffic to a sub-logical link into which specified ones of the physical links in the logical link are aggregated so as to meet a specified condition of the traffic.
- 10 2. The band control device as claimed in claim 1 wherein the distributor comprises a traffic monitor for monitoring a traffic amount which meets the specified condition, and a manager for assigning the physical links of a number corresponding to the traffic amount to the sub-logical link.
- 15 3. The band control device as claimed in claim 2 wherein when detecting that the traffic amount becomes smaller than a predetermined value during a predetermined period, the traffic monitor releases an aggregation of the sub-logical link to assign no sub-logical link exclusively used for the traffic which meets the specified condition.
- 20 4. The band control device as claimed in claim 1 wherein the controller transmits/receives a message for establishing the sub-logical link to/from an opposite controller.
5. The band control device as claimed in claim 4 wherein the controller relays the message to a subsequent apparatus.
- 25 6. The band control device as claimed in claim 1 wherein a number of physical links which the distributor aggregates into the sub-logical link is smaller than the number of physical links which the logical link aggregates.
7. The band control device as claimed in claim 4 wherein the controller returns a message for establishing a sub-logical link port established based on the received message as a return sub-logical link port.

8. The band control device as claimed in claim 4 wherein the controller returns a response message for the received message.
9. The band control device as claimed in claim 4 wherein the controller returns, in response to the message requesting the establishment of the sub-logical link, a message rejecting the request.
- 5
10. The band control device as claimed in claim 8 wherein when receiving the response message, the controller commences a communication of the traffic which meets the specified condition.
11. The band control device as claimed in claim 5 wherein when a 10 band of the sub-logical link requested by the received message is larger than an assignable band of a sub-logical link in the subsequent apparatus, the controller discards the message and returns an error message.
- 15
12. The band control device as claimed in claim 5, further comprising a scheduler for transmitting a traffic, with a priority control, to the subsequent apparatus,
- the controller instructing the scheduler to transmit the traffic which meets the specified condition with a priority, and transmitting a message notifying a request band of the traffic to the subsequent 20 apparatus.
13. The band control device as claimed in claim 4 wherein when a communication of the traffic which meets the specified condition is completed, the controller transmits a message requesting an establishment release of the sub-logical link corresponding to the 25 traffic.
14. The band control device as claimed in claim 13 wherein when receiving the message requesting the establishment release, the controller relays the establishment release request message to a subsequent apparatus.
- 30
15. The band control device as claimed in claim 4, further comprising a traffic monitor for monitoring a traffic amount which meets the

specified condition,

the controller releasing the establishment of the sub-logical link when the traffic amount becomes smaller than a predetermined amount.

5 16. The band control device as claimed in claim 4 wherein when the physical link included in the sub-logical link degenerates and no physical link substituted for the degenerated physical link can be secured, the controller transmits a message requesting that a number of physical links included in the sub-logical link should be decreased.

10 17. The band control device as claimed in claim 4 wherein when no physical link exists since the physical link excluded in the sub-logical link is degenerated, the controller transmits a message requesting that a number of physical links included in the sub-logical link should be decreased.

15 18. The band control device as claimed in claim 4, further comprising a traffic monitor for monitoring an amount of a traffic except the traffic which meets the specified condition,

the controller decreasing a number of physical links included in the sub-logical link when the traffic amount becomes larger than a predetermined amount, and outputting a message requesting that the number should be decreased.

20 19. The band control device as claimed in claim 16, 17, or 18 wherein when receiving the number decrease request message, the controller decreases the number of physical links included in a corresponding sub-logical link.

25 20. The band control device as claimed in claim 19 wherein the controller further relays the number decrease request message to a subsequent apparatus.

21. The band control device as claimed in claim 4 wherein when receiving a message requesting an establishment of a sub-logical link different from the sub-logical link already established and no

requested band can be secured, the controller returns an error message.

22. The band control device as claimed in claim 21 wherein when receiving the error message, a source controller of the establishment
5 request message transmits again the establishment request message after a standby for a fixed period.

23. The band control device as claimed in claim 4 wherein when a plurality of sub-logical links are established in the single logical link, the controller determines a sub-logical link for decreasing a number of
10 physical links by a priority of the sub-logical link.

24. The band control device as claimed in claim 1, further comprising a collector for receiving the traffic from an opposite apparatus.